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Creation of monkey/mouse xenograft animal model for the research on epidermal stem cell plasticity

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To investigate the plasticity of epidermal stem cells in vivo and the fundamental mechanisms controlling stem cell fate *in vivo*, which is urgently required in regenerative medicine and treatments for cell replacement, a monkeymouse chimera model was developed.

The xenografted chimeras were achived by directly injected epidermal stem cells of male rhesus monkey into mouse blastocysts, which were subsequently transferred to pseudo-pregnant mouse and embryos were allowed to develop and bear. A variety of methods, including immunohistochemical assay, PCR as well as fluorescence *in situ* hybridization, were used to test the monkey donor cells contribution in the recipients.

Of eight formed embryonic chimeras, five had the presence of monkey specific SRY gene in mouse tail tissue detected by PCR, while two of three live recipients had the presence of SRY gene in peripheral blood. PCR analysis on genomic DNA from 4 different adult tissues showed that donor derived monkey cell presented in multiple tissues(i.e. liver, heart, kidney and eyeball). Five formed embryonic chemeras selected from PCR positive possessed of epidermal derived cells in liver examined at tissue collection as confirmed by flurorescence in hybridization. In this xenogeneic system, the engrafted donor derived monkey cells persisted in multiple tissues for at least 6 month after birth.

Taken together, these findings suggest that we successfully developed monkey-mouse chimeras, in which xenogeneic monkey cells exist up to 6 month later. This model provides an invaluable and effective approach for *in vivo* investigating epidermal stem cell behavior, and further *in vivo* examining fundamental mechanisms controlling stem cell fates in the future.

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